

Patent Claims:

1. Method for actuating an electromechanical parking brake device for a brake that can be actuated by means of an electromechanical actuator, in which the actuator is comprised of an electric motor and a reduction gear that is connected downstream of the electric motor and is provided for converting a rotational motion into a translatory motion, and the electromechanical parking brake device is provided in the form of a locking mechanism which can prevent the rotational motion of the actuator in the direction of release and which can only be released again by further application,  
**characterized in that** during the actuation of the parking brake device, a mean value  $M_{\text{park}}$  of the torque of the electric motor, which is required for exerting the application force of the brake corresponding to the application of the parking brake, is determined and stored while the actuator position ( $\phi$ ) is simultaneously detected, and the electric motor is actuated at later points in time in such a fashion that it generates said torque  $M_{\text{park}}$  that is multiplied by a correction factor  $k_{\eta} \geq 1$  in order to maintain or increase the exerted tension force.
2. Method according to claim 1, **characterized in that** the detection of the torque ( $M_{\text{park}}$ ) is achieved by measuring the current supplied to the electric motor (10).
3. Method according to claim 1, **characterized in that** the determined mean torque value ( $M_{\text{park}}$ ) is controlled with regard to a lower limit value and is set to this lower

limit value when it falls below this limit value.

4. Method according to claims 1 and 2, **characterized in that** the electric motor (10) after the first actuation of the parking brake device is actuated in previously defined periods of time in such a way that it generates the torque ( $M_{\text{park}}$ ) multiplied by the correction factor  $k_{\eta} \Rightarrow 1$ .
5. Method according to claims 1 and 2, **characterized in that** the electric motor (10) is actuated depending on an actuator temperature difference in such a way that it generates the torque ( $M_{\text{park}}$ ) multiplied with the correction factor  $k_{\eta} \Rightarrow 1$ .
6. Method according to any one of the claims 1 to 4, **characterized in that** the actuator temperature difference corresponds to the difference between the actuator temperature during the first actuation of the parking brake device or the last operation the electric motor (10), respectively, for generating the torque ( $M_{\text{park}}$ ) multiplied by the correction factor  $k_{\eta} \Rightarrow 1$  and the actual actuator temperature.
7. Method according to any one of the claims 5 or 6, **characterized in that** the actuator temperature is estimated by means of an actuator temperature model.
8. Method according to any one of the claims 1 to 7, **characterized in that** the correction factor  $k_{\eta}$  depends on the actuator efficiency.
9. Method according to any one of the claims 1 to 8, **characterized in that** the correction factor  $k_{\eta}$  depends on

a measured or estimated inclined position of the vehicle.

10. Method according to any one of the claims 1 to 8, **characterised by that** for releasing the parking brake device the electric motor (10) is actuated for a predefined period of time in such a way that a torque specification  $M_{rel} = k_{rel} * k_{\eta} * M_{park}$  is satisfied.
11. Method according to any one of the claims 1 to 8, **characterized in that** for releasing the parking brake device the electric motor is operated for a predefined period of time in such a way that its maximum torque  $M_{rel} = M_{max}$  is generated.
12. Method according to any one of the claims 1 to 9, **characterized in that** during releasing the parking brake device a new characteristic curve for actuator position - application force is estimated.